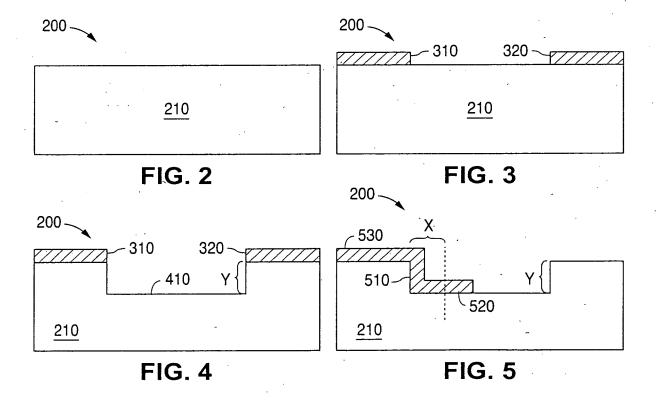
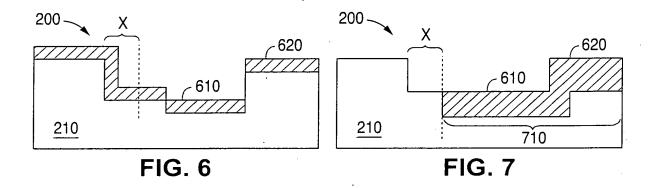


FIG. 1 (PRIOR ART)





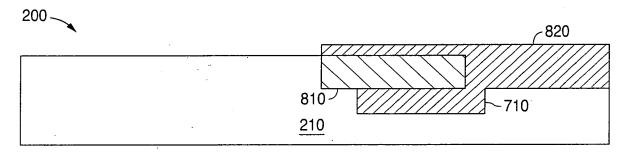


FIG. 8

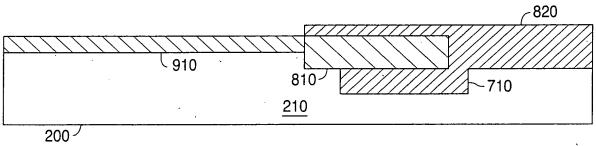


FIG. 9

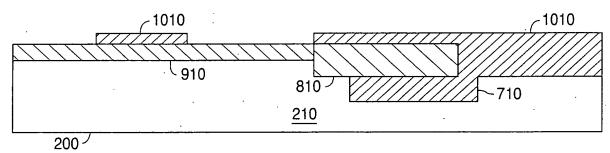


FIG. 10

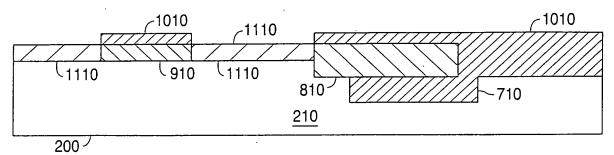


FIG. 11

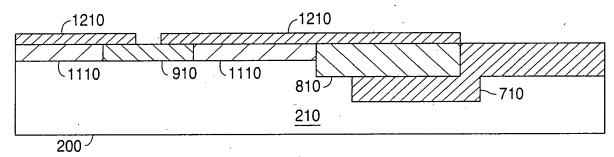


FIG. 12

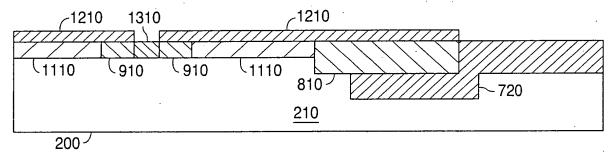


FIG. 13

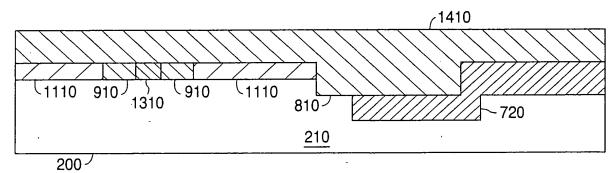


FIG. 14

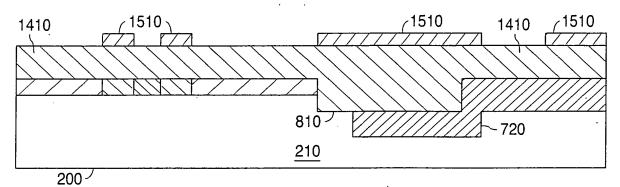


FIG. 15

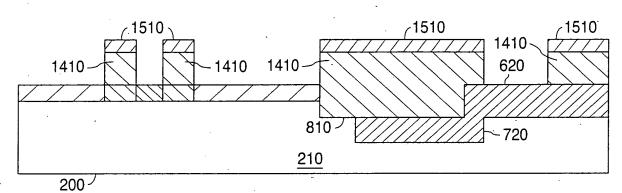


FIG. 16

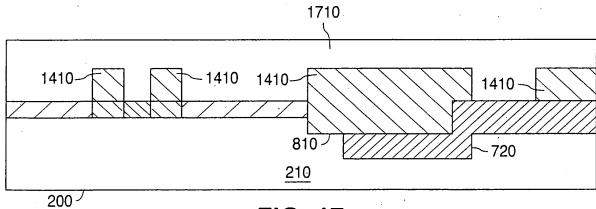


FIG. 17

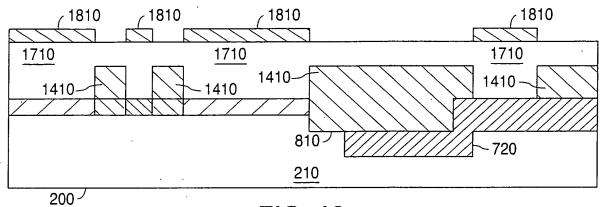


FIG. 18

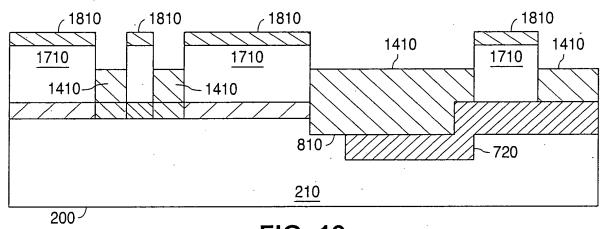


FIG. 19

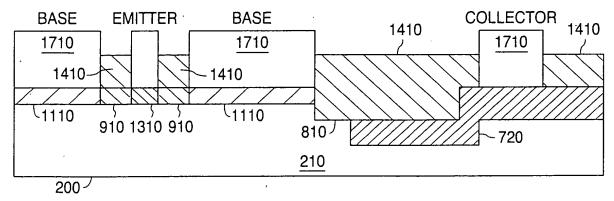


FIG. 20

c 2110

ON SUBSTRATE LAYER 210 PLACE TRENCH MASK 310 OVER A FIRST AREA (BASE/EMITTER AREA) AND PLACE TRENCH MASK 320 OVER A SECOND AREA (SINKER/COLLECTOR AREA)

c 2120

ETCH A SHALLOW TRENCH 410 IN SUBSTRATE LAYER 210
BETWEEN THE FIRST AREA AND THE SECOND AREA AND
REMOVE TRENCH MASKS 310 AND 320

2130

PLACE A COLLECTOR AND SINKER MASK 510, 520, 530 OVER THE PORTION OF THE BOTTOM OF SHALLOW TRENCH 410 THAT IS ADJACENT TO THE FIRST AREA

_/ 2140

SELECT THE LATERAL EXTENT OF THE HORIZONTAL PORTION 520 OF THE COLLECTOR AND SINKER MASK 510, 520, 530 TO CONTROL THE DISTANCE OF A SUBSEQUENT LATERAL DIFFUSION OF COLLECTOR PORTION 610 FROM THE FIRST AREA

_/ 2150

PERFORM AN IMPLANT DOPING PROCEDURE TO DOPE COLLECTOR PORTION 610 AND SINKER PORTION 620 OF SUBSTRATE LAYER 210 AND REMOVE THE COLLECTOR AND SINKER MASK 510, 520, 530

c 2160

APPLY HEAT TREATMENT TO DIFFUSE THE DOPANT IN COLLECTOR PORTION 610 AND THE DOPANT IN SINKER PORTION 620 TO FORM SINKER AND COLLECTOR LAYER 710

2170 م

TERMINATE HEAT TREATMENT WHEN THE LATERAL DIFFUSION OF DOPANT IN COLLECTOR PORTION 610 REACHES A DESIRED DISTANCE FROM THE WALL OF TRENCH 410 ADJACENT TO THE FIRST AREA (BASE/EMITTER AREA)

TO STEP 2210

FIG. 21

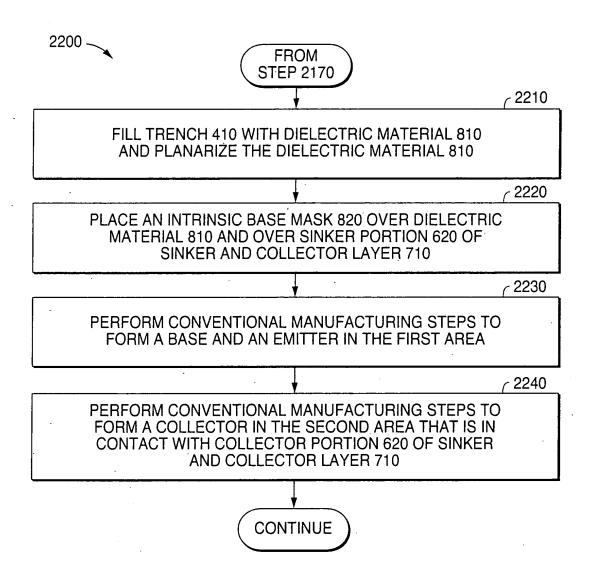


FIG. 22